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Noncontingent positive, positive and aversive, and aversive feedback:

A study in learned helplessness and depression

by

Patricia L. Duffy

**A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
DOCTOR OF PHILOSOPHY**

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INTRODUCTION

Depression is probably the most prevalent psychological disturbance. Not only do we all experience occasional, transient periods of mild dejection, but survey research indicates that 15% of American adults may be significantly depressed at any one time. It is further estimated that each year in the United States about 125,000 people are hospitalized for depressive symptoms, and another 200,000 receive outpatient care. In addition, depression is a component in most of the 23,000 suicides occurring annually in this country, and an accompaniment in most nonpsychiatric ailments as well. The annual costs in treatment and time lost from work due to depressive illnesses runs into the billions of dollars (Schuyler & Katz, 1973; Redick, 1974). Yet despite depression's rank as a major mental health problem, its etiology, treatment, and prevention are not adequately understood.

Approaches to understanding depressive states and conditions have generally taken one of the following forms: psychoanalytic theory, which contrues depression as reflecting an inferred, underlying psychic conflict, largely outside of awareness; cognitive theory, which sees the cause of depression as a maladaptive cognitive-perceptual bias, also operating largely outside of awareness; behavioral theory, which sees as the central antecedent feature of depression insufficient response-contingent positive reinforcement; and biological theory, which considers depression to be a disease or disorder with a specific organic, etiologic agent or defect.

Until relatively recently most of the literature on depression has come from psychoanalytically and biologically oriented investigators. The last 15 years or so, however, has seen the active pursuit of theory and research on depression by cognitive and behavioral investigators as well. In his review of contemporary theories of depression, Blaney (1977) attributes much of the recent momentum to the theoretical and empirical work of Beck (1967, 1972, 1974), Lewinsohn (1974), and Seligman (Abramson, Seligman, & Teasdale, 1978; Seligman, 1974, 1975).

Beck's (1967, 1972, 1974) cognitive model proposes that the cause of depression is a "negative cognitive set," comprised of a negative view of the self (low self-esteem), a negative view of the world, and negative expectations for the future (pessimism). According to the model, the depressed affective state characteristic of most depressions is secondary to these negative cognitions. Furthermore, certain cognitive schemas come to dominate the thought processes of the depressive and lead to the triadic cognitive distortions. Beck's outline of these schemas, or systematic errors in thinking, include arbitrary interpretation, selective abstraction, exaggeration, incorrect labeling, and overgeneralization. Additionally, Beck proposes a feedback model to explain the downward spiral of worsening depression. Although depression can be precipitated by external events, it is thought to be the perception and appraisal of the precipitant that induces depression.

Lewinsohn's (1974) theory is fundamentally different from Beck's. His behavioral approach suggests that depression is due to a person's low rate of response-contingent positive reinforcement. Rate of reinforcement

is presumed to be a function of 1) the number of potentially reinforcing events; 2) the number of reinforcing events present in the environment; and 3) the ability or skill of the individual to attain the reinforcements. Lewinsohn emphasizes that it is not low rate of reinforcement, but low rate of response-contingent positive reinforcement that is crucial in producing depression.

The Learned Helplessness Theory of Depression

The third major impetus to current research on depression has come from Seligman (Abramson, Seligman, & Teasdale, 1978; Seligman, 1974, 1975). Seligman's theory has received both behavioral and cognitive labels (e.g., Becker, 1974; Eastman, 1976). Seligman's views on depression are couched in animal research: Dogs exposed to inescapable or unavoidable noxious stimuli behave passively when subsequently placed in an escapable aversive situation (MacKintosh, 1974; Maier & Seligman, 1976; Seligman, Maier, & Solomon, 1971). Such prior experience with uncontrollable aversive stimuli is said to result in learned helplessness, manifested in a motivation deficit (passivity) and a cognitive deficit (interference with learning new response-relief contingencies). The organism learns that response and outcome are independent. Seligman hypothesizes that reactive depressions in humans is such a state of induced helplessness. Based on laboratory findings showing a correspondence between outcomes of the learned helplessness paradigm and what is known of human depression in symptomatology, etiology, cure, and prevention, Seligman extended the theory to account for changes in emotionality (de-

pressed affect and low self-esteem) as well as motivational and cognitive deficits (Abramson, Seligman, & Teasdale, 1978; Maier & Seligman, 1976; Seligman, 1974, 1975). According to the theory, perception of noncontrol is the causal factor in depression.

There is much overlap between Seligman's model of depression and the views of Beck and Lewinsohn. Both Seligman and Beck emphasize subjective perception, and concur on the presence of a mental set which mediates the relationship between environmental events and subsequent behaviors. When the mental set is a "negative cognitive set" as Beck suggests, or the perception of noncontrol as Seligman proposes, depression will result. On the other hand, both Seligman and Lewinsohn presume that responses that are rewarded will be emitted, and both seek to explain why depressives show a decrease in responsiveness to reward. Seligman and Lewinsohn implicate noncontrol, or noncontingency between response and outcome, in depression. Finally, both draw from learning models of response suppression, and emphasize the depressive symptom of noninitiation.

It is apparent that the elements of perception and control are not unique to Seligman's theory of depression, but occur in other current theories as well. Furthermore, Seligman is not alone in believing perceptions of helplessness are at the root of depression. Bibring (1953), Melges and Bowlby (1969), and Lichtenberg (1957) all propose similar causes of depression. Rather, the unique contribution of Seligman's theory lies in the experimental procedures it suggests (Blaney, 1977).

A recent reformulation of the learned helplessness model of depression is summarized in the following statements:

1. Depression consists of four classes of deficits: motivational, cognitive, self-esteem, and affective.

2. When highly desired outcomes are believed improbable or highly aversive outcomes are believed probable, and the individual expects that no response in his repertoire will change their likelihood, (helplessness) depression results.

3. The generality of the depressive deficits will depend on the globality of the attribution for helplessness, the chronicity of the depression deficits will depend on the stability of the attribution for helplessness, and whether self-esteem is lowered will depend on the internality of the attribution for helplessness.

4. The intensity of the deficits depends on the strength, or certainty, of the expectation of uncontrollability and, in the case of the affective and self-esteem deficits, on the importance of the outcome. (Abramson, Seligman, & Teasdale, 1978, p. 68)

The model is not intended to be an all-inclusive one, however.

According to Seligman:

Learned helplessness need not and does not characterize the whole spectrum of depressions, but is rather an attempt to understand depressions in which the individual is slow to initiate responses, believes himself to be powerless and hopeless, and has a negative outlook on the future--which began as a reaction to having lost his control over gratification and relief from suffering. (1975, p. 81)

Although learned helplessness provides a framework for conceptualizing and dealing with reactive depressions, it may play a role in process depressions as well. As Seligman states:

Endogenous depressions, while not set off by an explicit helplessness-inducing event, also may involve the belief in helplessness. I suspect that a continuum of susceptibility to this belief may underlie the endogenous-reactive continuum. At the extreme endogenous end, the slightest obstacle will trigger in the depressive a vicious circle of beliefs in how ineffective he (sic) is. At the extreme reactive end, a sequence of disastrous events in which a person is actually helpless is necessary to force the belief that responding is useless. (1975, p. 81)

Psychotherapy, according to the theory, should enable the patient to find out and believe his/her responses produce the outcomes he/she wants. The perception and experience of control produces personal effectiveness,

and to the extent that controllable events occur, a sense of mastery and resistance to depression will occur. Forced exposure to the fact that responding produces relief is even suggested as a therapeutic technique. It is further proposed that experience controlling outcomes may protect individuals from the helplessness caused by inescapable, uncontrollable outcomes. That is, a history of control or noncontrol may immunize or predispose, respectively, individuals against helplessness-produced depression.

Thus, the theory appears to have important implications for understanding how many individuals become depressed, and for treating and preventing this occurrence.

An Operational Description of the Learned Helplessness Model

The concept of uncontrollability

The distinction between controllable and uncontrollable outcomes is central to the phenomenon and theory of learned helplessness, and will be dealt with in some detail. Recall that learning theorists have usually viewed the relations between instrumental responding and outcomes that organisms could learn about in terms of the conditional probability of an outcome following a response $p(O/R)$, which varies from zero to 1.0. At zero, a response never produces reinforcement or punishment; at 1.0, every response produces reinforcement or punishment (MacKintosh, 1974). Intermediate values represent partial reinforcement or partial punishment.

Conditional probabilities are not inclusive of the relations between responses and outcomes about which an organism may learn, however. Im-

portant outcomes (rewards and punishments) can sometimes occur when no specific response has been made, and organisms are sensitive to such a contingency as well; that is, they learn the probability of an outcome or reinforcer occurring in the absence of a response ($p(O/-R)$) (MacKintosh, 1974).

These contingencies can be represented along a two-dimensional response contingency space, shown in Figure 1. The x-axis represents $p(O/R)$, while the y-axis measures $p(O/-R)$. It is believed that organisms learn about variations in both dimensions conjointly. That is, subjects may learn the extent to which an outcome occurs when they do not make a specific response at the same time they learn the extent to which an outcome occurs when they do make a specific response; and systematic changes in behavior occur with systematic changes along both dimensions.

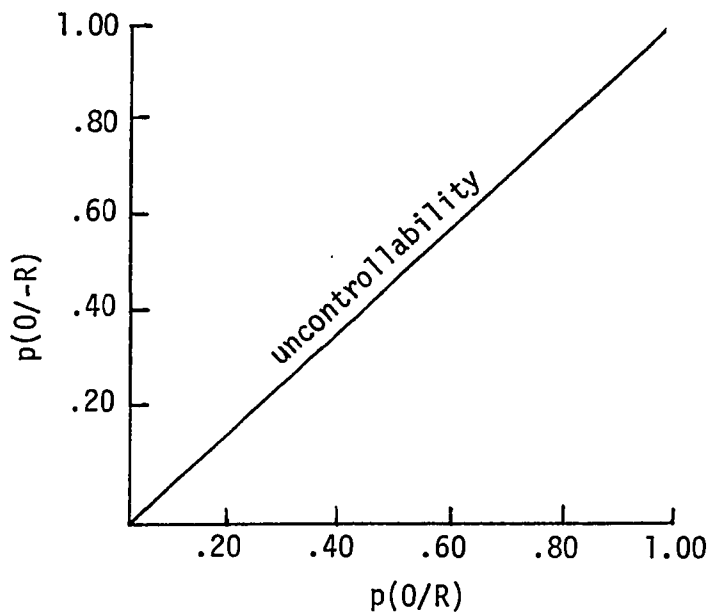


Figure 1. The response contingency space

The points in the response contingency space which are of particular concern to the learned helplessness model are those along the 45° line, where whether or not an organism responds, it still gets the same density or reinforcement or punishment. The probability of reinforcement or punishment in the presence of a given response does not differ from the probability of reinforcement or punishment in the absence of that response, and responding and outcome are therefore independent.

The concepts of controllability and uncontrollability are defined within this space. When there is something an organism can do or refrain from doing that changes what it gets, it has control. A response is in control of an outcome if and only if $p(O/R) \neq p(O/-R)$; that is, the probability of reward or punishment given a response is different than the probability of reward or punishment in the absence of the response. When a response will not change what an organism gets, the response and outcome are independent and $p(O/R) = p(O/-R)$. When this is true of all responses, the organism cannot control the outcome; it is uncontrollable and nothing the organism does makes any difference--objectively, it is helpless.

Theoretical stages in the model

While uncontrollability is a critical aspect of the theory, its operational existence does not insure a resultant subjective experience of helplessness. Rather, such an outcome requires progression through three separate stages (Maier & Seligman, 1976; Seligman, 1975; Seligman, Maier, & Solomon, 1971). The first stage consists of the organism receiving information that the probability of the outcome is independent of performing a given response; that is, it is uncontrollable. The second and critical

stage involves the organism's registering and processing cognitively the information about the contingency outlined in the first stage. Two processes are involved at this stage: learning that a contingency exists concerning the independence of responding and outcome, and developing the expectation that responding and outcome will remain independent on future trials. A reduction in motivation to control the outcome accompanies this operation. The final stage involves the generalization or transferring of the expectation developed that responding and outcomes are independent, to new learning situations.

Resultant response deficits can be motivational, cognitive, or emotional, and are behaviorally referred to as learned helplessness effects (Maier & Seligman, 1976). The term "learned helplessness" is used to describe both the behavioral deficits which result from learning that responses and outcomes are independent, and the process which is thought to underlie these deficits.

A Review of Relevant Literature

Learned helplessness

The earliest evidence bearing on the learned helplessness model was provided by McCulloch and Bruner (1939), who found that rats that had previously received uncontrollable shocks made more errors in a subsequent brightness discrimination task than did control subjects not previously shocked. The authors suggested that a new response to shock had been established in shock treatment which inhibited the ordinary discrimination response. The actual concept of learned helplessness, however, developed

out of a series of studies on traumatic avoidance learning in dogs (Overmier & Seligman, 1967; Seligman & Maier, 1967). The primary finding was the demonstration that about two-thirds of dogs exposed to inescapable shocks in a Pavlovian harness subsequently failed to learn to escape shocks in a simple two-way shuttlebox; whereas dogs first exposed to escapable shocks in the harness learned to escape in the shuttlebox as rapidly as did nonshocked controls. Helplessness in the dog was thus defined by two behaviors: 1) dogs which have experienced uncontrollable shock fail to initiate responses to escape shock later, or are slower to make responses than are naive dogs; 2) dogs, if they make a later response which turns off shock, have more trouble learning that responding is effective than naive dogs. A number of other studies reported similar interference effects in dogs (e.g., Maier, 1970; Overmier, 1968; Seligman, Maier, & Geer, 1968). Deficits in escaping or avoiding shock after experience with uncontrollable shock have also been observed in rats (e.g., Looney & Cohen, 1972; Seligman & Beagley, 1975; Weiss, Kriekhaus & Conte, 1968), cats (Seward & Humphrey, 1967; Thomas & Dewald, 1977), Fish (e.g., Padilla, Padilla, Ketterer, & Giacalone, 1970), and humans (e.g., MacDonald, 1946; Thornton & Jacobs, 1971). In the earliest human research bearing on the learned helplessness model, MacDonald (1946) found that inescapable shocks delivered to the finger retarded the later acquisition of finger-withdrawal avoidance in response to shock. In the first test of the model with human subjects, Thornton and Jacobs (1971) found that humans exposed to inescapable shock failed to escape from later shock, and failed to associate responding and reinforcement even after making suc-

cessful escape responses. Their results also suggested different degrees of learned helplessness, varying by intensity and schedule of shock.

Similar deficits in escape performance have been produced by uncontrollable stimuli other than shock, including tumbling (Anderson & Paden, 1966), loud noise (Hiroto, 1974; Klein & Seligman, 1976; Miller & Seligman, 1975), and unsolvable discrimination problems (e.g., Hiroto & Seligman, 1975). In the Hiroto (1974) study, for example, students who received inescapable loud noise in a button-pressing task were debilitated in later learning to shuttle to escape noise, whereas escapable noise and no noise groups were not handicapped. The effect was larger when subjects were given chance vs. skill instructions, and in subjects who perceived reinforcement as determined by forces outside themselves (externals) rather than by their own behaviors (internals).

Research findings have shown that uncontrollability not only affects performance on tasks similar to the training tasks, but generalizes to dissimilar tasks as well (e.g., Harlow, Harlow, & Suomi, 1971; Hiroto & Seligman, 1975; Kahn, 1951; Powell & Creer, 1969). Hiroto and Seligman (1975), for example, conducted four experiments using college students as subjects. In the first study, treatment with inescapable or escapable aversive tone was followed by shuttlebox escape testing; in the second, treatment in insoluble or soluble discrimination problems was followed by shuttlebox escape testing; in the third, treatment with inescapable or escapable aversive tone was followed by anagram solution testing; and finally, treatment with insoluble or soluble discrimination problems was followed by anagram solution testing. Results showed that interference

with later learning was produced in the first three experiments, where subjects in the uncontrollable conditions performed less well than those in the controllable conditions or control subjects on the subsequent tasks; in the fourth study, results were in the same direction, although nonsignificant. For a thorough discussion on the generalization of helplessness across a variety of species, training situations, and test tasks, the reader is referred to Maier and Seligman's (1976) review.

In addition to passivity and slowed response-relief learning, researchers have observed anorexia and weight loss, and norepinephrine depletion in animals exposed to uncontrollable trauma (e.g., Mowrer & Vick, 1948; Weiss, 1968; Weiss, Stone, & Harrell, 1970). Finally, several studies have reported a species-specific time course to helplessness induced effects (e.g., Overmier, 1968; Overmier & Seligman, 1967; Padilla, Padilla, Ketterer, & Giacalone, 1970).

Learned helplessness and depression

The above research shows several parallels between helplessness-induced outcomes and characteristics of psychological depression (Beck, 1972; Becker, 1974; Mendels, 1970; Schuyler, 1974; Seligman, 1974). These commonalities include passivity or psychomotor retardation; negative expectancies or loss of cognitive set that responses can produce desired outcomes; a time course; weight loss and anorexia; and pharmacologic changes, notably norepinephrine depletion. On the basis of these similarities, Seligman (1974, 1975) proposed learned helplessness as a laboratory model for naturally occurring depression in humans. Subsequent research produced additional parallels between the effects of helplessness

training and depression. Human subjects exposed to uncontrollable events have reported greater feelings of noncontrol than subjects exposed to controllable outcomes and control subjects (e.g., Benson & Kennelly, 1976; Gatchel, Paulus, & Maples, 1975; Roth & Kubal, 1975). Furthermore, self-report mood measures have indicated more depressed affect following following helplessness induction (e.g., Gatchel, Paulus, & Maples, 1975; Miller & Seligman, 1975; Roth & Kubal, 1975; Willis & Blaney, 1978). Roth and Kubal (1975), for instance, were interested in investigating two factors thought to affect the impact of experiences with noncontingent outcomes--amount of helplessness training, and the importance attributed to the helplessness task. Training consisted of varying intensities of noncontingent reinforcement on concept-formation problems differing in perceived importance. Roth and Kubal (1975) found that both task importance and amount of training increased the likelihood of helplessness effects on subsequent tasks. The results of a posttreatment questionnaire indicated that both feelings of helplessness and incompetence increased with increases in helplessness training. Furthermore, feelings of depression and anger were associated with helplessness training for subjects in the important task group. In another study, Gatchel, Paulus, and Maples (1975) found that in addition to showing greater response latency on an anagrams task, subjects pretreated with inescapable tones also reported greater depression, anxiety, and hostility as measured by an adjective check list, relative to subjects pretreated with escapable tones. Self-ratings of helplessness made during the experiment revealed that subjects in the inescapable group reported significantly greater feelings of help-

lessness relative to escapable group subjects. Depressed mood, especially, and feelings of helplessness, hopelessness, and powerlessness are characteristic features of psychological depression (Beck, 1972; Becker, 1974; Mendels, 1970; Schuyler, 1974; Seligman, 1974).

Further support for the model comes from studies which have looked for the behavioral symptoms of learned helplessness in depressed persons (e.g., Klein, Fencil-Morse, & Seligman, 1976; Miller & Seligman, 1973, 1975; Miller, Seligman, & Kurlander, 1975; Price, Tryon, & Raps, 1978). Miller and Seligman (1973) examined changes in expectancies for success following reinforcement in chance and skill tasks in depressed vs. nondepressed college students. Results showed that nondepressed students exhibited greater expectancy changes than depressed subjects in skill tasks, while the changes of depressed and nondepressed subjects were similar in chance tasks. Findings are consistent with the model's prediction that depressed subjects should perceive reinforcement as more response independent than nondepressed subjects. In a similar study, Miller, Seligman, and Kurlander (1975) found that depressed-anxious subjects showed less expectancy change in skill tasks than nondepressed-anxious subjects, while these groups exhibited similar expectancy change in chance tasks. Nondepressed-anxious and nondepressed-nonanxious subjects did not differ in either skill or chance tasks. Again, depressed subjects perceptually distorted the outcomes of skilled responding as being response independent. Anxiety by itself was not a factor in perceptual distortion, suggesting this bias may be specific to depression. Miller and Seligman (1975) reported that nondepressed subjects given

helplessness training in the way of uncontrollable noise, exhibited impairment in anagram performance similar to that shown by depressed subjects given no helplessness training. Similar results have been reported when insoluble discrimination problems comprise the helplessness task (Klein, Fencil-Morse, & Seligman, 1976). Klein, Fencil-Morse, and Seligman (1976) also found that when depressed subjects attributed their failure to the difficulty of the problem rather than to their own incompetence, performance improved. This further suggested that it is a decreased belief in personal competence or effectiveness that produced helplessness deficits, rather than failure itself.

Additional support for the learned helplessness model of depression comes from studies in which the impact of helplessness-reducing techniques on depression is assessed (e.g., Klein, Fencil-Morse, & Seligman, 1976; Klein & Seligman, 1976; Langer & Rodin, 1976; Schulz, 1976). Klein and Seligman (1976), for example, found that nondepressed subjects receiving inescapable noise and depressed subjects receiving no noise showed noise escape deficits in a subsequent shuttlebox task, and greater perceptions of response-reinforcement independence, compared with nondepressed subjects receiving no noise. Experience with solvable discrimination problems reversed the performance deficits associated with helplessness training and depression, and the perceptions of response-reinforcement independence.

The Present Study

According to the original learned helplessness model of depression (Maier & Seligman, 1976; Seligman, 1974, 1975) it was simply the perceived

uncontrollability of events which was supposed to produce the cognitive, motivational, and emotional deficits associated with psychological depression. The model made no differential predictions regarding the effects of noncontingent positive and noncontingent aversive outcomes. Seligman claimed "that not only trauma occurring independently of responses, but noncontingent positive events, can produce helplessness and depression" (1975, p. 98), and he pointed to the so-called success depression as an example of this phenomenon. Abramson, Seligman, and Teasdale (1978), however, recently revised this aspect of the learned helplessness theory, as follows:

We view depression, as a syndrome, to be made up of four classes of deficits: (a) motivational, (b) cognitive, (c) self-esteem, and (d) affective . . . Whereas the first three deficits are the result of uncontrollability, we believe the affective changes result from the expectation that bad outcomes will occur, not from their expected uncontrollability . . . Thus, only those cases in which the expectation of response-outcome independence is about the loss of a highly desired outcome or about the occurrence of a highly aversive outcome are sufficient for the emotional component of depression. (p. 65)

Their premise concerning the effects of noncontingent positive outcomes is admittedly based primarily on "everyday observations" rather than experimental evidence, however. Although previous research has generated considerable support for the model, all studies to date with the exception of Benson and Kennelly (1976) have dealt with the effects of aversive or both positive and aversive feedback delivered noncontingently.

Benson and Kennelly (1976) were interested in determining whether noncontingent positive events would in and of themselves produce the cognitive and motivational deficits associated with learned helplessness, as predicted by the model, or whether noncontingent aversive events must

also be present. To investigate this, they assigned subjects to one of four treatments involving the solution of discrimination problems: (a) in the soluble condition, subjects were presented with soluble problems and received response contingent "correct" and "incorrect" feedback; (b) in the insoluble-aversive condition, subjects were presented insoluble problems and received response-noncontingent "correct" and "incorrect" feedback; (c) in the always correct condition, subjects were presented response-noncontingent "correct" feedback to all solution attempts; and (d) in the control condition, no treatment was given. All subjects were then given an anagrams solution test task, from which three dependent measures were derived: number of trials to criterion, mean latency, and number of failures to solve. Results showed that the insoluble-aversive group performed significantly worse and the soluble group significantly better than the control and always correct groups on the trials to criterion measure; the control and always-correct groups did not differ significantly. No differences were observed among groups on the two remaining performance measures. Responses to a five-choice attribution question given at the end of the experiment indicated that both the insoluble-aversive and always-correct groups saw their performance on the discrimination tasks as more uncontrollable than the soluble group.

Benson and Kennelly's (1976) findings did not support the model's claim that noncontingent positive events should produce cognitive and motivational deficits on subsequent tasks. However, Benson and Kennelly's (1976) failure to find significant treatment effects for two of their three dependent variables suggested that other factors might have con-

tributed to performance on the anagrams task, and thus to failure to support the model's predictions concerning noncontingent positive feedback. Control subjects, for example, exhibited great variability in anagrams-solving ability. Furthermore, there is evidence from Hiroto's (1974) study that subjects in helplessness experiments vary in their predispositions to helplessness. Hiroto provided evidence that learned helplessness is analogous to Rotter's (1966) concept of internal-external locus of control, and suggested that internals are less likely to exhibit helplessness than internals following treatment with insoluble tasks. Benson and Kennelly (1976) suggested that future research control for individual differences in anagram-solving ability, and predisposition to helplessness. This will be one aspect of the present study.

Secondly, the present study will replicate the Benson and Kennelly (1976) study, but with the addition of three treatment groups: an always incorrect group; a group which receives 75% aversive and 25% positive response-noncontingent feedback; and a group which receives 75% positive and 25% aversive response-noncontingent feedback. Contrary to expectations of the theory, Benson and Kennelly (1976) concluded that aversive response-noncontingent, but not positive response-noncontingent feedback, was responsible for the deficits associated with helplessness training. If this is the case, varying the proportions of positive and negative noncontingent feedback, while holding the amount of uncontrollable outcomes constant, should result in different behavioral effects. The addition of these three groups, then, will allow for greater observation of

the effects of different proportions of positive and aversive noncontingent feedback.

Thirdly, the present study will further expand on Benson and Kennelly's (1976) experiment, by assessing subjects' psychological mood following helplessness training, with a self-report depression inventory. Although depressed mood is generally considered the most defining symptom in the diagnosis of depressive illnesses, relatively few helplessness-induction studies have considered mood depression as a dependent variable. In his critique of contemporary theories of depression, Blaney (1977) stresses that, "The helplessness model of depression requires studies showing that depressed affect . . . results from the induction" (p. 206). Furthermore, no research has tested the model's new position regarding the relationship between uncontrollable events and depressed affect. That is, although both positive and negative uncontrollable outcomes should produce cognitive, motivational, and self-esteem deficits, only uncontrollable aversive outcomes are expected to produce more depressed mood.

Finally, the present study will further assess the impact and effectiveness of experimental manipulations through a posttreatment questionnaire. Subjects will provide information concerning the controllability and importance of the training task.

Hypotheses

The present study has two main hypotheses, both predicted from the learned helplessness model of depression (Abramson, Seligman, & Teasdale,

1978):

First, it is expected that subjects in the response-noncontingent feedback groups (that is, the 100% aversive, 75% aversive and 25% positive, 50% aversive and 50% positive, 25% aversive and 75% positive, and 100% positive noncontingent feedback subjects) will exhibit cognitive and motivational deficits relative to subjects in the response-contingent and control groups, on the three anagram performance measures: number of trials to criterion, mean latency, and number of failures.

Secondly, it is expected that subjects in the 100% aversive, 75% aversive and 25% positive, 50% aversive and 50% positive, and 25% aversive and 75% positive noncontingent feedback groups will show more depressed mood following helplessness training than subjects in the no-treatment control, response-contingent feedback, and 100% positive noncontingent feedback groups.

METHOD

Subjects

Subjects were 25 male and 45 female undergraduate psychology students at The Ohio State University, who received extra course credit for participating in the study. Four subjects were dropped from the experiment--three because of inadequate knowledge of the English language, and one for failure to follow task instructions.

Design

The design of this study was similar to that of Hiroto and Seligman (1975), Benson and Kennelly (1976), and Tennen and Eller (1977). Seven groups of subjects were tested on a depression checklist and an anagrams task immediately after one of the following treatments: (a) A contingent reinforcement group was treated with five soluble, 8-trial Levine-type (1971) discrimination problems. Each subject received response contingent correct and incorrect feedback following each trial. At the end of each problem, the subject received response-contingent feedback to his/her statement of what he/she thought was the correct solution. (b) A noncontingent aversive feedback group was treated with five insoluble, 8-trial Levine-type problems. Each subject received noncontingent aversive feedback following each trial, and at the end of each problem received negative feedback when asked for his/her solution. (c) A noncontingent reinforcement group was treated with the same five insoluble discrimination problems. Each subject always received noncontingent positive feedback

following each trial, and at the end of each problem was told his/her solution was correct. (d), (e), and (f) Three additional groups were treated with the same five insoluble Levine-type tasks, with each subject receiving some combination of random, noncontingent positive and aversive feedback, according to his/her treatment group. At the end of each problem, the subject received negative feedback to his/her statement of what he/she thought was the correct value. The specific treatment contingencies were these: (d) The 75% aversive-25% positive feedback group received random noncontingent aversive feedback on 75% of the trials and random noncontingent positive feedback on 25% of the trials within each problem. (e) The 50% aversive-50% positive feedback group received random noncontingent aversive feedback on half the trials and random noncontingent positive feedback on half the trials within each problem. (f) The 25% aversive-75% positive feedback group received random noncontingent aversive feedback on 25% of the trials and noncontingent positive feedback on 75% of the trials within each problem. (g) A control group received no helplessness treatment.

This design differed from that of Benson and Kennelly (1976) in three ways: (a) Subjects were tested on a depression checklist as well as anagrams task following treatment. (b) Subjects were exposed to 8-trial rather than 10-trial helplessness training problems, because the combinations of aversive and positive feedback chosen for this study did not conform to 10-trial problems. (c) The earlier study did not have subject groups comparable to the noncontingent 75% aversive-25% positive feedback

group, the noncontingent 25% aversive-75% positive feedback group, and the 100% noncontingent aversive feedback group.

Apparatus and Materials

Treatment task

Treatment problems for all groups, except the control group, were composed of a series of four-dimensional Levine-type (1971) stimulus patterns, similar to those used by Hiroto and Seligman (1975) and Benson and Kennelly (1976). Each of the four dimensions had two values: (a) The letter was either A or T. (b) The size of the letter was either large or small. (c) The color of the letter was either red or black. (d) The border of the letter was either a circle or a square. The stimulus patterns were presented one at a time on 12.7 x 20.2 cm index cards contained in a 3-ring binder. Task instructions were given by means of a cassette tape recorder. For the contingent feedback group, the solutions to the five discrimination problems in order of presentation were: large, circle, red, t, and small.

Anagrams test task

All subjects received a series of 20 five-letter anagrams adopted from Tresselt and Mayzner (1966), and similar to those used by Hiroto and Seligman (1975) and Benson and Kennelly (1976). Examples are BIATH and DGUEJ. The letter order for all anagrams was 53124, i.e., the first letter of the solution word was the fifth letter of the anagram, the second letter of the solution word was the third letter of the anagrams, etc. These anagrams, composed of .64 cm letters, were presented singly on 10.2

x 15.5 cm index contained in a 3-ring binder. Instructions for the task were given by means of a cassette tape recorder. A stopwatch was used to time subjects' responses. The solutions to the anagrams, in the order they were presented, were BATON, JAUNT, BLARE, PANIC, YOUTH, POWER, JOUST, DRINK, AUDIT, TRAIN, ROACH, POKER, OPIUM, JUDGE, HABIT, SUGAR, COUGH, BATCH, VITAL, and FLING.

Depression ratings

Before and after treatment, subjects were asked to complete separate forms of Lubin's (1967a) Depression Adjective Checklists (DACL) (see Appendix A). Form A was administered prior to treatment to control for initial differences in mood depression among subjects. Form B comprised the posttreatment mood depression measure.

There are seven forms of the DACL, each with 32 or 34 items. The items are adjectives the respondent checks if descriptive of "how you feel now--Today." An individual's score is the sum of the number of depressive adjectives checked and the number of positive adjectives not checked. Norms are available for a number of normal and psychiatric populations. Internal consistency of the DACL ranges from .79 to .90, and split-half reliabilities range from .82 to .93, depending on type of subjects (normals or patients), sex of subjects, and form of the test (Lubin, 1966, 1967b).

Cross validation studies have shown depressed patients to differ significantly from normals on all seven checklists, while patients diagnosed as depressed obtain higher scores on the DACL than patients with other diagnoses (Lubin, 1967b). Various forms of the DACL have been found to

correlate significantly, and to a moderate to high degree, with other measures of depression including the MMPI Depression scale and Beck's Depression Inventory; global ratings by clinicians; and self-ratings of depression (Fogel, 1966; Lubin, 1967b).

Experience measures

To control for individual differences in anagram-solving ability, and predisposition to helplessness, all subjects were given a timed anagrams pretest composed of 10 five-letter anagrams adopted from Tresselt and Mayzner (1966) (see Appendix B), and Rotter's (1966) Internal-External Locus of Control Scale (I-E Scale) (see Appendix C).

Posttreatment questionnaire

To further assess the impact and effectiveness of experimental manipulations, all subjects except controls completed a 7-item questionnaire (see Appendix D). Subjects responded to each item using a 7-point Likert-type scale, ranging from "strongly disagree" (1) to "strongly agree" (7). A rating of "4" indicated neither agreement nor disagreement, or uncertainty. In answering the first six items, subjects indicated the extent to which they felt their performance on the discrimination problems was due to 1) the difficulty of the problem; 2) luck or chance; 3) experimenter control or manipulation; 4) their effort; 5) their skill or lack of it; and 6) the ease of the problems. On the seventh item subjects indicated how important it was for them to do well on the problems.

Procedure

Subjects participated in the experiment on an individual basis. All subjects were randomly assigned to one of the seven groups. Each group consisted of 10 subjects. There were from three to five males, and five to seven females, in each condition. The training situation was conducted by one of two experimenters, one male and one female. The test situation was conducted in an adjoining room by a third experimenter (this author), who was blind to the experimental condition of subjects.

Prior to the training phase of the study, each subject was directed to an experimental room where he/she completed the anagrams pretest, the I-E Scale, and the DACL Form A. Subjects in the control condition then completed the DACL Form B, and the anagrams test task, with no intervening activity. All other subjects proceeded to the helplessness training phase of the experiment. There the binder containing the discrimination problems was placed before the subject, the tape recorder was switched on, and the following instructions, patterned after Hiroto and Seligman (1975), were presented:

You will now be asked to work on some discrimination problems. Tasks like these are good measures of general ability and correlate well with academic success. In solving these problems you will be looking at cards like the experimenter has placed before you. Notice that each card has two stimulus patterns on it. The sample patterns are composed of four different dimensions and the two values associated with each dimension. The dimensions and their values are as follows: The letter is either A or T. The size of the letter is either large or small. The color of the letter is either red or black. Finally, the border of the letter is either a circle or a square. Each stimulus pattern has one value from each of the four dimensions. The experimenter has arbitrarily chosen one of the eight values as being correct. For each card, you are to choose which side contains this correct value, and the

experimenter will tell you if your choice was correct or incorrect. In a few trials, you can learn what the correct value is by this feedback. The object is for you to figure out what the answer is so that you can choose correctly as often as possible. At the end of each problem you will be asked for your solution, and the experimenter will tell you whether or not you are correct.

After the instructions were given, four trials of a single four-dimensional problem were completed by each subject in order to clarify the task of finding the "correct" value. Any questions concerning the task and how to respond to it were answered at this time.

The experimental stimulus patterns were composed of four dimensions. Five different problems were presented in blocks of 8 trials each. On each trial, the subject was to indicate, either verbally or by pointing, which of the two stimulus patterns on the card contained the correct value, the left one or the right one. A maximum of 15 seconds was allowed for any one trial. If after 10 seconds, a subject had not made a response, he/she was told he/she had five seconds in which to make a decision.

In the soluble problem condition (a), each subject was given contingent feedback of "correct" and "incorrect" after he/she indicated which side of the card contained the correct value. At the end of each problem, the subject was asked, "What is the correct value?" and after answering was told whether he/she was correct or incorrect.

After each subject in the noncontingent aversive feedback group (b) responded with the side he/she thought was the correct value, he/she was told, "That's incorrect." To his/her statement as to the solution of each problem, he/she was told, "That's the wrong answer." In contrast, after

each subject in the noncontingent positive feedback condition (c) indicated the side he/she thought contained the correct value, he/she was told, "That's correct." After indicating what he/she thought was the correct solution to each problem, the subject was told, "That's the right answer."

In the remaining insoluble conditions, (d), (e), and (f), each subject was given predetermined, randomized "correct" and "incorrect" feedback after he/she indicated which side of the card contained the correct value. At the end of each problem when the subject indicated what he/she thought was the correct value, he/she was told, "That's the wrong answer." Each subject in the noncontingent 75% aversive-25% positive feedback condition (d) was given the following randomized correct (C) and incorrect (I) feedback; IICICIII for Problem 1; IIICICII for Problem 2; CIIICIII for Problem 3; IICIIICII for Problem 4; and ICIIICIII for Problem 5. The predetermined, randomized reinforcement schedule for each subject in the noncontingent 50% aversive-50% positive feedback condition (e) was ICCIICCI for Problem 1; ICCICICI for Problem 2; ICICICICI for Problem 3; ICCIICCI for Problem 4; and ICCICICI for Problem 5. Finally, the predetermined, randomized feedback schedule for each subject in the noncontingent 25% aversive-75% positive feedback condition (f) was CCICICCC for Problem 1; CCCICICC for Problem 2; ICCICCCC for Problem 3; CCICICCC for Problem 4; and CICCICCC for Problem 5.

Immediately following treatment with soluble or insoluble discrimination problems, or after completion of the DACL Form A in the control condition, subjects proceeded to the test phase of the experiment. Each sub-

ject first completed the DACL Form B. Then the binder containing the test task anagrams was put before the subject, the tape recorder was turned on, and the following instructions, taken largely from Hiroto and Seligman (1975), were given:

You will now be asked to solve some more anagrams. As you recall, anagrams are words with the letters scrambled. The problem for you is to unscramble the letters so they form a word. When you have found the word tell the experimenter what it is. Now, there could be a pattern or principle by which to solve the anagrams; but that is up to you to figure out. The experimenter cannot answer any questions now, but will answer any questions you might have when the experiment is over.

The subjects then worked on the 20 soluble anagrams, each having the same letter solution sequence. The solution time for each anagram was recorded. Each problem was allotted a maximum time limit of 100 seconds; if the solution had not been determined within 90 seconds, the subject was told he/she had 10 seconds in which to complete the problem. If the problem was not solved, a time of 100 seconds was recorded, and the subject was directed to go on to the next anagram.

After completion of the anagrams test task, all subjects except control group subjects completed the seven-item posttreatment questionnaire.

The final minutes of the session were devoted to debriefing. Subjects were informed of the methodological details of the experiment, the deceptions involved, and the hypotheses being tested. All questions posed by subjects were answered. Subjects were then thanked for their participation and dismissed.

Independent and Dependent Variables

Independent variable

There was one independent variable in the study: type of treatment. Treatment was comprised of five levels of noncontingent feedback, plus one level of contingent feedback, and one level of control. The five levels of noncontingent feedback were 100% aversive, 75% aversive and 25% positive, 50% aversive and 50% positive, 25% aversive and 75% positive, and 100% positive.

Dependent variables

There were 11 dependent variables of interest. Three of these were used in several previous studies to assess cognitive and motivational effects of helplessness training, and are derived from subjects' performances on the anagrams test task. These were (a) trials to criterion, with criterion defined as the solution of three consecutive problems in less than 15 seconds each, after which no failures occur. This criterion is assumed to indicate that the subject has found the underlying solution principle. For subjects who failed to reach criterion, the trials to criterion measure was taken as the earliest trial on which the subject could have reached criterion if more anagrams were given; (b) mean response time for the 20 anagrams; and (c) number of failures to solve, with failure defined as a solution time of 100 seconds. The fourth dependent variable was mood depression, as measured by subjects' scores on the DACL Form B.

Six additional dependent variables relate to subjects' perceptions of control during the treatment phase of the experiment, and were measured by

subjects' responses to a posttreatment questionnaire. High scores on items referring to the difficulty or ease of the problems, luck, or experimenter control indicate perceptions of uncontrollability. High scores on items attributing progress to skill or effort indicate perceptions of controllability. A final dependent variable was the degree of importance subjects attached to succeeding on the discrimination problems. This variable was also measured through a posttreatment questionnaire item. High scores on the item are associated with feeling it was important or desirable to do well on the problems.

Analysis

To evaluate the effects of treatments on anagram performance, the three anagrams measures--trials to criterion, mean latency, and number of failures to solve--were analyzed by separate one-way analyses of covariance (Kirk, 1968) using The Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) analysis of covariance procedure. For each analysis, a main effect was derived for treatment group (no-treatment control, contingent feedback, 100% aversive-noncontingent feedback, 75% aversive-25% positive noncontingent feedback, 50% aversive-50% positive noncontingent feedback, 25% aversive-75% positive noncontingent feedback, and 100% positive noncontingent feedback). The covariates controlled for were pretreatment anagram-solving ability, internal-external locus of control, and mood depression. One a priori comparison contrasting the pooled no-treatment control and contingent feedback groups with the combined noncontingent feedback groups was com-

puted for each dependent variable using a *t* ratio. In addition 10 a priori nonorthogonal contrasts were computed for each anagrams measure. These contrasts compared the no-treatment control group and the contingent feedback group with each of the noncontingent feedback groups using Dunn's multiple comparison procedure. Finally, a posteriori pairwise comparisons were made between the no-treatment control and contingent feedback groups, and among the noncontingent feedback groups, using Newman Keuls' test.

To evaluate the effects of treatments on mood depression, a one-way analysis of covariance (Kirk, 1968) was computed for the DACL Form B scores, with a main effect derived for treatment group. The SPSS (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) analysis of covariance procedure was used to compute the analysis. The covariates controlled for were anagram-solving ability, locus of control, and mood depression. One a priori contrast compared the pooled no-treatment control, contingent feedback, and 100% positive noncontingent feedback groups with the combined four remaining noncontingent feedback groups by use of a *t* ratio. Twelve a priori nonorthogonal comparisons were also made using Dunn's procedure. These contrasted the control group, the contingent feedback group, and the 100% positive noncontingent feedback groups with each of the remaining noncontingent feedback groups. Finally, Newman Keuls' test was used to make pairwise post hoc comparisons among the control, contingent feedback, and 100% positive noncontingent feedback groups, and among the four remaining noncontingent feedback groups.

Subjects' ratings on the seven posttreatment questionnaire items were analyzed by separate one-way analyses of variance (Kirk, 1968), using the

SPSS (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) analysis of variance procedure. For each analysis, a main effect was derived for treatment group. Newman-Keuls' test was used to make pairwise comparisons among the six group means.

RESULTS

There were three categories of dependent measures in this study: anagram performance, mood depression, and posttreatment questionnaire data. The results for each category will be considered separately.

Anagram Performance

According to the first hypothesis, subjects in the five helplessness training groups who received insoluble discrimination problems and non-contingent feedback should (a) require more trials to learn the anagram pattern; (b) take longer to solve the anagrams, and (c) fail to solve more anagrams, than subjects in the control group who did not receive training with discrimination problems, and subjects who received soluble discrimination problems and contingent feedback.

Dependent variable: Trials to criterion

The results of the analysis of covariance for the dependent variable Trials to criterion, where criterion is defined as the solution of three consecutive anagrams in 15 seconds or less, are presented in Table 1. The covariates controlled for were pretreatment anagram-solving ability, locus of control, and mood depression. The analysis of covariance indicated no significant effect for treatment ($F(6,60) = 1.81, p = .099$). As shown in Table 2, the means adjusted for the covariates range from $\bar{X} = 10.40$ for the control group which received no discrimination problems, to $\bar{X} = 20.04$ for the group which received 25% aversive-75% positive noncontingent feedback on insoluble discrimination problems.

Table 1. Analysis of covariance for the dependent variable Trials to criterion

Source	df	MS	F	p > F
Covariates	3	49.880	1.034	.379
Treatment group	6	89.737	1.811	.099
Error	60	47.717		

Table 2. Group means and pairwise comparison results for the dependent variable Trials to criterion

Treatment group ^a		
Control	b	10.40
Contingent		16.59
100%-noncontingent		13.68
75%-/25%+noncontingent		16.00
50%-/50%+ noncontingent		15.85
25%-/75%+noncontingent		20.04
100%+noncontingent		17.28

^a $\underline{n} = 10$ for each group.

^b $\underline{p} < .05$.

A planned comparison of the pooled control and contingent feedback groups with the combined noncontingent feedback groups produced the expected result: The pooled control and contingent groups learned the pattern for anagram solution more readily than the combined noncontingent groups ($\underline{t}(60) = 1.68$, $\underline{p} < .05$).

Although it was predicted that the control and contingent feedback groups would learn the solution pattern more quickly than the noncontingent feedback groups, a priori pairwise comparisons using Dunn's procedure produced only one significant difference among pairs of means (see Table 2): The no-treatment control group solved the pattern more quickly than the 25% aversive-75% positive noncontingent feedback group.

Since the analysis of covariance failed to produce a significant F for treatment group, no post hoc comparisons among means were carried out.

Dependent variable: Mean latency

The results of the analysis of covariance for mean solution time on the 20-item posttreatment anagrams task are presented in Table 3. Results indicate a significant effect due to treatment ($F(6,60) = 3.293$, $p = .007$).

Table 3. Analysis of covariance for the dependent variable Mean latency

Source	df	MS	F	p > F
Covariates	3	986.855	2.750	.050
Treatment group	6	1181.673	3.293	.007
Error	60	358.838		

Group means adjusted for the effects of the covariates (anagram solving ability, locus of control, and mood depression) appear in Table 4. As shown, means range from $\bar{X} = 20.67$ for the control group to $\bar{X} = 54.93$ for the group which received 25% aversive-75% positive noncontingent feedback on insoluble discrimination problems.

Table 4. Group means and pairwise comparison results for the dependent variable Mean latency

Treatment group ^a		
Control	20.67] b
Contingent	37.74	
100%-noncontingent	25.12	
75%-25%+noncontingent	31.12	
50%-/50%+noncontingent	34.82] c
25%-/75%+noncontingent	54.93	
100%+noncontingent	35.85	

^a $n = 10$ for each group.

^b $p < .01$.

^c $p < .05$.

A planned comparison contrasted the pooled no-treatment control and contingent feedback groups with the combined noncontingent feedback groups. Although the average time to solve the 20 anagrams was less for the combined control and contingent groups than the pooled noncontingent groups, this difference was not significant ($t(60) = 1.43$, $p < .10$).

The results of the pairwise comparisons of the control and contingent groups with each of the noncontingent groups using Dunn's method indicated only one significant difference (see Table 4): As predicted, the control group solved the anagrams more rapidly than the 25% aversive-75% positive noncontingent feedback group ($p < .01$).

Post hoc comparisons of pairs of means by the Newman-Keuls' method indicated one additional significant difference (see Table 4): Subjects in the 100% aversive noncontingent condition solved the anagrams more quickly ($\bar{X} = 25.12$) than subjects in the 25% aversive-75% positive noncontingent condition ($\bar{X} = 54.93$) ($p < .05$).

Dependent variable: Failures to solve

Analysis of covariance results for the dependent variable number of failures on the 20-item anagrams test task appear in Table 5. The covariates controlled for in the analysis were ability to solve anagrams, internality/externality, and mood depression. Results indicate a significant effect due to treatment ($F(6,60) = 2.874$, $p = .016$).

Table 5. Analysis of covariance for the dependent variable Failures to solve

Source	df	MS	F	p > F
Covariates	3	15.736	1.493	.226
Treatment group	6	30.295	2.874	.016
Error	60	10.542		

As depicted in Table 6, group means adjusted for the covariates range from $\bar{X} = 2.37$ for the no-treatment control group to $\bar{X} = 7.41$ for the 25% aversive-75% positive noncontingent feedback group.

An a priori comparison contrasted the pooled no-treatment control and contingent feedback groups with the pooled noncontingent feedback groups. As hypothesized, the comparison indicated a significant difference between

Table 6. Group means and pairwise comparison results for the dependent variable Failures to solve

Treatment group ^a		
Control	2.37	b
Contingent	4.33	
100%-noncontingent	2.42	
75%-/25%+noncontingent	3.10	
50%-/50%+noncontingent	4.13	
25%-/75%+noncontingent	7.41	c
100%+noncontingent	4.88	

^a $n = 10$ for each group.

^b $p < .01$.

^c $p < .05$.

the pooled groups ($t(60) = 3.448$, $p < .005$), with the combined noncontingent feedback subjects failing more often on the anagrams task.

Planned pairwise comparisons of means using Dunn's method produced one significant finding (see Table 6): As expected, the control group failed to solve fewer anagrams than the group which received 25% aversive-75% positive noncontingent feedback on the insoluble training tasks ($p < .01$).

Additional pairwise comparisons of means using Newman-Keul's procedure for making a posteriori comparisons indicated significant differences between the 100% aversive ($\bar{X} = 2.42$) and the 25% aversive-75% positive ($\bar{X} = 7.41$) noncontingent groups, and between the 75% aversive-25% positive

($\bar{X} = 3.10$) and the 25% aversive-75% positive ($\bar{X} = 7.41$) noncontingent groups ($p_s < .05$) (see Table 6). In both instances the 25% aversive-75% positive noncontingent group failed more often on the anagrams task.

Anagram performance results provide little support for the learned helplessness model of depression. Although as expected, the pooled control and contingent groups outperformed the pooled noncontingent groups on the Trials to criterion and Failures to solve measures, there was no significant difference between the pooled groups on the Mean latency variable. Furthermore, pairwise comparisons between the control and noncontingent groups, and between the contingent and noncontingent groups produced only one of ten expected differences on each variable. In all instances, the control group outperformed the 25% aversive-75% positive noncontingent feedback group.

The similarity of results for the three anagram performance measures may be largely due to the strong relationships among these measures. As shown in Table 7, Pearson product-moment correlations between trials and latency, trials and failures, and latency and failures were $r(70) = .84$, $p < .001$; $r(70) = .74$, $p < .001$; and $r(70) = .94$, $p < .001$, respectively. The two dependent measures, Mean latency and Failures to solve, may simply be different names for the same data. This is no doubt an artifact of the computational procedure, since a time of 100 seconds was equivalent to a failure in computing solution times.

Table 7. Correlations among the anagrams, mood depression, and covariate measures, with corresponding probability levels in parentheses

	A1	A2	A3	B	C1	C2	C3
Anagrams							
Trials (A1)	1.000	.8411 (.001)	.7375 (.001)	.0159 (.448)	.0449 (.356)	-.1787 (.069)	.0602 (.310)
Latency (A2)		1.000	.9390 (.001)	.1009 (.203)	.2514 (.018)	-.1917 (.056)	.0743 (.271)
Failures (A3)			1.000	.1691 (.080)	.1978 (.050)	-.0969 (.212)	.1171 (.166)
Depression							
DACL-B (B)				1.000	.2063 (.043)	.2252 (.030)	.7713 (.001)
Covariates							
Anagram solving ability (C1)					1.000	-.1285 (.145)	.1898 (.058)
I-E (C2)						1.000	.2152 (.037)
Depression DACL-A (C3)							1.000

Mood Depression

According to the second hypothesis, subjects in the noncontingent groups who received aversive feedback during helplessness training with insoluble discrimination problems should show more mood depression than subjects in the no-treatment control group, subjects in the contingent feedback group, and subjects in the 100% noncontingent feedback group.

The results of the analysis of covariance for the dependent variable Mood depression, as measured by scores on Lubin's (1967a) DACL Form B, appear in Table 8. The covariates controlled for were pretreatment anagram solving ability, mood depression as measured by the DACL Form A, and internal-external locus of control. The analysis of covariance indicates no significant effect for treatment ($F(6,60) = 1.455$, $p = .209$).

Table 8. Analysis of covariance for the dependent variable Mood depression

Source	df	MS	F	p > F
Covariates	3	344.432	34.932	.001
Treatment group	6	14.346	1.455	.209
Error	60	9.860		

Group means adjusted for the effects of the covariates are presented in Table 9. The means range from $\bar{X} = 5.87$ for the 100% positive noncontingent feedback group to $\bar{X} = 9.38$ for the 100% aversive noncontingent feedback group.

Table 9. Group means and pairwise comparison results for the dependent variable Mood depression

Treatment group ^a	
Control	7.24
Contingent	7.54
100%+noncontingent	5.87
100%-noncontingent	9.38
75%-/25%+noncontingent	8.20
50%-/50%+noncontingent	8.96
25%-/75%+noncontingent	8.38

^a $n = 10$ for each group.

^b $p < .10$.

A planned comparison contrasted the pooled control, contingent feedback, and 100% positive noncontingent feedback groups with the pooled 100% aversive, 75% aversive-25% positive, 50% aversive-50% positive, and 25% aversive-75% positive noncontingent feedback groups. As predicted, the combined noncontingent groups showed significantly more mood depression than the pooled control, contingent, and 100% positive noncontingent groups ($t(60) = 2.489$, $p < .01$).

Although the mean depression scores for the control, contingent, and 100% positive noncontingent groups were less than those of the remaining noncontingent groups (see Table 9), a priori pairwise comparison by Dunn's method revealed no significant differences. There was a tendency, however, for the 100% positive noncontingent group ($\bar{X} = 5.87$) to exhibit less

depressed affect than the 100% aversive noncontingent group ($\bar{X} = 9.38$) ($p < .10$). Compared with the control and contingent groups, this difference suggests a positive affective change (facilitation effect) for the 100% positive noncontingent group and a negative affective change (interference effect) for the 100% aversive noncontingent group.

Since the analysis of covariance failed to produce a significant F for treatment groups, no a posteriori pairwise comparisons were made.

As with findings for the anagram measures, results concerning the effects of helplessness training on mood depression provide only partial support for the learned helplessness model of depression. As expected, the combined control, contingent, and 100% positive noncontingent groups reported less depressed mood than the remaining noncontingent groups. However, results failed to support the model in that pairwise comparisons between the control, contingent, and 100% noncontingent groups and each of the remaining noncontingent groups did not indicate more depressed mood for the groups receiving aversive noncontingent feedback.

Effects for Subjects' Sex

To assess whether subjects' sex was related to experimental outcomes, a Groups X Sex analysis of covariance was also performed on the anagram performance and mood depression measures (see Appendix E). Results indicated no main effect for Sex on any variable, but showed a significant effect for the Group X Sex interaction on the depression measure ($p < .05$). Given that the main effects for treatment were comparable to those reported with the one-way analyses, and considering the unreliability of results

on small cell numbers, the one-way analyses were given major consideration in this study.

Posttreatment Questionnaire

On the posttreatment questionnaire all subjects except controls answered six items concerning the extent of control they believed they had on the helplessness training task, and one item about the importance of doing well on the task. Subjects responded to the items using a 7-point scale ranging from "strongly disagree" (1) to "strongly agree" (7). Responses to the questionnaire were intended to provide information regarding the impact of experimental manipulations. A separate one-way analysis of variance was computed for each item. Group means and standard deviations on the items are presented in Table 10.

Item 1: Difficulty of the problems

Item 1 measured the extent to which subjects felt their performance on the helplessness training task was due to the difficulty of the problems. Group means for the item ranged from $\bar{X} = 3.7$ for the 100% positive noncontingent feedback group to $\bar{X} = 4.7$ for the 100% aversive noncontingent feedback group. Results of the analysis of variance reflected no significant differences among groups ($F(5,54) = .481, p = .789$).

Item 2: Luck or chance

Means on Item 2 which measured the extent to which subjects felt their performance on the training task was due to luck or chance ranged from $\bar{X} = 1.9$ for the 75% aversive-25% positive noncontingent group to $\bar{X} = 3.0$ for the contingent, 100% aversive noncontingent, and 25% aversive-75%

Table 10. Means and standard deviations on the posttreatment questionnaire items for contingent (C) and noncontingent (NC) groups

Item		Group ^a					
		C	100%-NC	75%-/25%+NC	50%-/50%+NC	25%-/75%+NC	100%+NC
1. Difficulty	\bar{X}	4.5	4.7	4.1	4.6	4.5	3.7
	SD	1.354	1.567	1.853	1.776	1.841	1.889
2. Luck/chance	\bar{X}	3.0	3.0	1.9	2.0	3.0	2.7
	SD	1.700	2.160	1.853	1.414	2.055	2.406
3. Experimenter manipulation	\bar{X}	3.3	4.2	3.4	4.2	4.0	2.6
	SD	2.111	2.044	2.119	2.044	1.944	1.716
4. Effort	\bar{X}	5.3	4.3	4.0	4.4	3.9	5.2
	SD	.675	1.889	2.211	1.647	1.663	1.549
5. Skill	\bar{X}	5.1	4.6	4.3	4.8	5.8	5.3
	SD	.738	1.713	1.947	1.317	.789	1.252
6. Ease	\bar{X}	4.7	2.9	3.7	3.2	3.5	4.9
	SD	.823	1.524	1.947	1.619	1.780	1.524
7. Importance	\bar{X}	5.7	5.1	4.7	4.9	5.2	6.3
	SD	.483	1.449	2.111	1.792	.919	.483

^a \underline{n} = 10 for all groups.

positive noncontingent groups. It appears that most subjects did not see luck or chance as playing a large role in their discrimination problems performance. Analysis of variance results revealed no significant differences among groups ($F(5,54) = .699, p = .626$).

Item 3: Experimenter control or manipulation

Item 3 measured the degree to which subjects believed their training task performance was due to the control or manipulation of the experimenter. As depicted in Table 10, group means ranged from $\bar{X} = 2.6$ for the 100% positive noncontingent feedback group to $\bar{X} = 4.2$ for the 100% aversive and 50% aversive-50% positive noncontingent feedback groups. Results suggest that most subjects did not see experimenter control as a major factor in their performance. The analysis of variance produced no significant effect for group ($F(5,54) = .994, p = .430$).

Item 4: Effort expended

Group means for Item 4 which indicated the degree to which subjects felt their performance on the training task was due to the amount of effort they expended on the tasks ranged from $\bar{X} = 3.9$ for the 25% aversive-75% positive noncontingent feedback group to $\bar{X} = 5.3$ for the contingent feedback group. Analysis of variance results indicated no significant effect for treatment ($F(5,54) = 1.278, p = .287$).

Item 5: Skill or lack of skill

Item 5 measured the extent to which subjects believed their performance on the discrimination problems was due to their own skill, or lack of skill. As shown in Table 10, means ranged from $\bar{X} = 4.3$ for the 75% aversive-25% positive noncontingent group to $\bar{X} = 5.8$ for the 25%

aversive-75% positive group. The majority of subjects in all groups seemed to feel their performance reflected amount of skill. The analysis of variance for Item 5 reflected no significant differences among groups ($F(5,54) = 1.532, p = .195$).

Item 6: Ease of problems

Responses to Item 6 reflect the extent to which subjects felt their performance on the training task was due to the ease of the discrimination problems. Mean ratings ranged from $\bar{X} = 2.9$ for the 100% aversive noncontingent feedback group to $\bar{X} = 4.9$ for the 100% positive noncontingent feedback group. Results of the analysis of variance indicated a significant effect for group ($F(5,54) = 2.648, p = .033$). Pairwise comparisons among means using Newman-Keuls' multiple comparison procedure failed to reflect any significant differences, although the comparison of the 100% positive and 100% negative noncontingent groups approaches significance ($p < .10$).

Item 7: Importance of doing well

Item 7 measured the importance or desirability subjects attached to doing well on the helplessness training problems. Group means for the item ranged from $\bar{X} = 4.7$ for the 75% aversive-25% positive noncontingent feedback group to $\bar{X} = 6.3$ for the 100% positive noncontingent feedback group (see Table 10). The majority of subjects in all groups seemed to feel it was important to do well on the training task. Analysis of variance results indicated no significant treatment group differences ($F(5,54) = 1.872, p = .114$).

The results of the analyses on the questionnaire data indicate that the helplessness induction procedure was ineffective in producing differential perceptions of control among contingent and noncontingent groups. It was anticipated that in contrast to noncontingent subjects, contingent subjects would score higher on items attributing progress to skill or effort, and lower on items attributing performance to the difficulty or ease of the problems, luck, or experimenter control. Although the contingent group did see their performance as due to amount of skill, and not to luck or experimenter control, so did most subjects in the noncontingent groups. As anticipated, most subjects in the contingent and noncontingent groups reported it was desirable or important to them to do well on the discrimination problems.

DISCUSSION

The results obtained in the present study are generally incompatible with expectations. First, it was hypothesized that exposure to helplessness training in the form of insoluble discrimination problems and noncontingent feedback would result in interference effects on a subsequent anagrams task. As predicted the pooled noncontingent groups required more trials to learn the anagram solution pattern, and failed to solve more anagrams than the pooled control and contingent groups. Contrary to expectations, however, the pooled groups did not differ significantly in their average response times, although there was a tendency for the combined control and contingent groups to solve the anagrams more quickly. Of particular concern is that the model failed to hold for individual comparisons of the control and contingent groups with each of the noncontingent groups. Only one contrast--the control group vs. the group which received 25% aversive and 75% positive noncontingent feedback--was significant, and in the predicted direction, on both the latency and failures measures. A more puzzling observation is that the direction of scores on the anagram measures suggested a tendency for the treatment task to produce interference effects for the group which received soluble problems and contingent feedback, as well as for the groups which received insoluble problems and noncontingent feedback. The finding of no significant difference in anagram performance between the control and contingent groups is consistent with previous findings (e.g., Hiroto & Seligman, 1975; Roth & Bootzin, 1974), although some researchers (e.g., Benson & Kennelly, 1976) have reported a facilitation effect for their contingent

groups. Both are compatible with helplessness theory. However, the finding that the 25% aversive-75% positive noncontingent group performed less well than the 100% aversive noncontingent group on the mean latency measure, and less well than both the 100% aversive and 75% aversive-25% positive noncontingent groups on the number of failures measure cannot be explained by the model. According to the theory uncontrollable events--both positive and negative--should produce cognitive and motivation deficits as measured by anagram performance. In this study each noncontingent group received the same amount of uncontrollable outcomes. The expected effect of varying amounts of positive and aversive feedback, while holding the amount of noncontingent outcomes constant, is not dealt with by learned helplessness theory. If positive and negative uncontrollable outcomes contribute equally to producing cognitive and motivational deficits, then no differences among helplessness training groups would be expected. Such was the case for the majority of pairwise comparisons among noncontingent groups on the anagrams measures.

Secondly, it was hypothesized that helplessness training would produce more depressed mood in subjects who received aversive or some combination of aversive and positive noncontingent feedback on insoluble discrimination problems than in subjects who received no training, subjects who received contingent feedback on soluble problems, and subjects who received all positive noncontingent feedback on insoluble problems. The prediction was supported in the general sense; that is, the combined aversive noncontingent groups reported more depressed mood after training than did the combined control, contingent, and positive noncontingent

feedback groups. However, individual comparisons among group means failed to reflect significantly more depressed affect for the noncontingent groups receiving aversive noncontingent or positive and aversive noncontingent feedback. Although all differences between the control, contingent, and always positive noncontingent groups and the aversive-noncontingent groups were in the expected direction, only one contrast--the always positive noncontingent group vs. the always negative noncontingent group--even approached significance. This difference appeared to be due to a negative affective change for the aversive noncontingent group as well as to a positive affective change for the positive noncontingent group. Results indicate that the impact of noncontingent positive events on mood may be a therapeutic one; thus, treatment of depression with noncontingent positive experiences may be a possible alternative to treatment with controllable outcomes, the method proposed by Seligman (1974, 1975). The possible mood enhancement effect of uncontrollable positive feedback had not been observed in previous induction studies. The earlier study which examined the effects of positive noncontingent outcomes on behavior (Benson & Kennelly, 1976) did not include a measure of affect. It should be emphasized that the finding of lower depression scores for the noncontingent positive subjects was only directional--not significant. However, it does suggest a promising avenue for future investigation.

A failure to observe more depressed affect following helplessness induction is a not uncommon observation in the several studies which have included affect as a dependent variable (see Klein, Fencil-Morse, & Seligman, 1976; Klein & Seligman, 1976; Miller & Seligman, 1975), and is a

general criticism of the model (see Blaney, 1977; Buchwald, Coyne, & Cole, 1978). The finding of no significant differences among the control, contingent, and positive noncontingent groups, or among the aversive noncontingent groups is compatible with the hypotheses of this study. However, since previous research (e.g., Hiroto & Seligman, 1975; Roth & Kuba, 1975) has suggested a positive relationship between amount of helplessness training and the severity of subsequent deficits, the finding of a positive linear relationship between percentage of aversive noncontingent feedback and degree of mood depression was anticipated. The reformulated learned helplessness model does not deal specifically with this issue. Abramson, Seligman, and Teasdale's (1978) statement that "Depression is most far reaching when the estimated probability of a positive outcome is low or the estimated probability of an aversive outcome is high" (p. 70) is difficult to interpret. Whether "far reaching" implies intensity or generality of helplessness effects is not specified.

The results of the posttreatment questionnaire administered to assess the impact of experimental manipulations on perceived controllability and task importance indicated that the experimental procedure may not have been effective in inducing differential perceptions of control between subjects who received contingent feedback to soluble problems and subjects who received noncontingent feedback to insoluble problems. This was not a wholly unexpected finding, since previous research has produced mixed results regarding subjects' perceptions of control following similar training procedures (e.g., Klein & Seligman, 1976; Miller & Seligman, 1976; Willis & Blaney, 1978). Furthermore, posttreatment questionnaire

results failed to provide an adequate explanation for the treatment effects which were observed in the study.

Analysis of questionnaire data indicated no significant differences among groups regarding the extent to which they attributed their performance on the training task to ease or difficulty of the problem, luck or chance, experimenter control or manipulation, effort, or skill. There was a tendency for subjects in the contingent as well as noncontingent groups to attribute their performance to amount of skill possessed; they did not see luck or experimenter control playing strong roles in their success or failure. In addition, the contingent and 100% positive noncontingent subjects believed that effort played a strong role in their performance. Problem ease was also seen as an important factor by the 100% positive noncontingent subjects.

The skill attribution may have been induced in part by the directions given with the problems, in that subjects were told the tasks were "good measures of general ability and correlate positively with academic success." Not expecting deception, and given these instructions, skill (or lack of skill) may have seemed the most reasonable explanation for the feedback received. Although the skill item was originally included in the questionnaire with the idea that high scores would reflect a feeling of controllability and low scores a belief in uncontrollability, as Benson and Kennelly (1976) proposed, this is apparently not the case. Subjects who perceive themselves as having limited skills would also be expected to rate the item high if they saw those skills contributing to their performance on the problems. Low ability, however, would seem to be associated

with feelings of noncontrol over outcomes (see Abramson, Seligman, & Teasdale, 1978). The item is an ambiguous one, and the results obtained here cannot be taken to indicate perceptions of controllability for all training groups--particularly given the significant pooled-groups and pairwise comparison which were observed, and the tendency for the contingent and noncontingent groups to show anagram performance deficits. Furthermore, previous studies (e.g., Benson & Kennelly, 1976) which have based the success of experimental manipulations on skill attributions may not be deriving accurate measures of controllability.

The uniformly low attributions to luck and experimenter control in the study indicate that subjects may not have seen the cause of their performance as external to themselves. A finding of external attributions in these instances would have indicated perceptions of noncontrol. However, the absence of external attributions here does not therefore imply perceptions of control, particularly considering that the attribution to skill probably reflects both perceptions of control and noncontrol.

The attribution of performance to effort by the contingent and 100% positive noncontingent groups indicates perceptions of control. However, the tendency for both groups to show anagram performance deficits is not consistent with a belief in controllability of outcomes. A belief in control for these two groups is compatible, however, with the tendency for both groups to exhibit less mood depression than the aversive noncontingent groups.

Only one comparison among means on the posttreatment questionnaire even approached significance, and indicated a tendency for the always

positive noncontingent subjects, as compared with the always negative noncontingent subjects, to attribute their performance to the ease of the discrimination problems. The always incorrect group and most of the remaining noncontingent groups were more likely than the always correct group to attribute their performance to problem difficulty. Perceiving the discrimination problems as difficult, and therefore uncontrollable, may explain the tendency for the aversive noncontingent groups to show performance deficits on the anagrams task. Since the contingent group subjects were divided in their attribution of performance to problem difficulty and ease, their tendency to show anagram performance deficits cannot be similarly explained. The 100% positive noncontingent group's attribution for success on the task to problem ease may explain the group's tendency to perform less well on the anagram's task than the no-treatment control group. They may have learned on the discrimination task that they did not have to work very hard for positive outcomes to occur, and transferred this expectation to the controllable anagrams task, with or without perceptions of noncontrol.

The explanations for the results of the study based on questionnaire data are speculative. Furthermore, they do neither a good job of explaining all the data, nor do they provide clearcut evidence for successful (or unsuccessful) induction of differential perceptions of control. A more direct question asking subjects to rate the amount of helplessness or non-control they felt during the training task may have been a better way of assessing the effectiveness of the induction procedure, but is probably more subject to demand characteristics (Orne, 1970). Also, a forced

choice format asking subjects to select a single attribution which best explained their training task performance might have helped clarify results.

There are several other possible explanations for the results obtained in the present study. Probably the most obvious is the possibility that the training task may have been insufficient to induce helplessness effects. This is unlikely since much of the support for the theory is based on induction studies using the same training task (e.g., Klein, Fencil-Morse, & Seligman, 1976; Hiroto & Seligman, 1975; Tennen & Eller, 1977). Another obvious possibility is that the test task may not have been sensitive to helplessness induced effects. This is also unlikely since the same anagram task has been used quite commonly in research cited in support of the model (e.g., Hiroto & Seligman, 1975; Roth & Kubal, 1975; Tennen & Eller, 1977).

According to the learned helplessness model, in order for affective deficits to occur, the uncontrollable situation must involve the loss of a highly desirable outcome or the gain of a highly undesirable outcome. Although results of the present study showed less depressed mood for the pooled control, contingent, and always positive noncontingent groups than for the pooled noncontingent aversive groups, this difference was due largely to improved affect for the noncontingent positive group rather than to mood deficits for the noncontingent aversive groups. Another possibility, then, is that the experimental procedure failed to generate perceptions of high task importance. This does not appear to be the case, however, as most subjects in the contingent as well as noncontingent

groups reported feeling it was important to succeed on the discrimination problems.

Finally, according to learned helplessness theory, prior experience at controlling outcomes immunizes subjects against the effects of procedures that otherwise lead to expectations of noncontingency and subsequent helplessness effects. The possibility exists that because subjects in the noncontingent groups in the present study were exposed to a solvable anagrams pretest (a covariate measure) prior to helplessness training, they were immunized to the debilitating effects of uncontrollability. Two lines of evidence argue against this possibility, however. First, the several investigators who have studied immunization effects have reported mixed results (e.g., Douglas & Anisman, 1975; Jones, Nation & Massad, 1977; Klein & Seligman, 1976). Secondly, the introduction of an interval of time as short as five minutes between the soluble and insoluble task has been shown to be sufficient to inhibit immunization effects (Teasdale, 1978). In the present study at least five minutes were spent completing the I-E Scale and DACL Form A (covariates), which followed the anagrams pretest and preceded helplessness training. Furthermore, it is expected that differential perceptions of control generated by the anagrams pretest would at least in part be picked up by the I-E and DACL Form A measures. Tennen and Eller (1977) circumvented the immunization issue by asking subjects to rate their anagram-solving ability just prior to the test task. However, their's was a less direct, and therefore less valid measure of anagram-solving skill.

Since the present study was in part a replication of Benson and Kennelly's (1976) investigation of the role of positive noncontingent feedback on anagram performance, a comparison of both sets of results is in order. The findings of the present study concerning the latency and failures to solve measures are fairly consistent with those of Benson and Kennelly (1976), who reported no significant pairwise differences among their control, contingent, always correct noncontingent, and always incorrect noncontingent groups. However, present results do not replicate Benson and Kennelly's (1976) findings for the trials to criterion measure. They reported that all pairs of means except for the control and always correct groups were different. In other words, the control, contingent, and always positive noncontingent groups took less trials to solve the pattern than the always noncontingent group. Similar findings in the present study were observed only to the extent that the control group solved the pattern more quickly than one of the groups which received aversive feedback. Certainly present results do not support the earlier study's conclusion that uncontrollable aversive, but not uncontrollable positive outcomes produce subsequent performance deficits. In the present study there was a directional, but nonsignificant, indication that the treatment task tended to produce interference effects for contingent and noncontingent subjects, including the always positive group, whereas in the previous study the induction of a facilitation or competency effect for the contingent group--rather than interference effects for the noncontingent groups--seems to have accounted for the significant differences on the failures to solve measure and the similar pattern of

scores on the other two measures. Furthermore, Benson and Kennelly concluded that their induction procedure was successful in producing the expected differences in perceptions of control/noncontrol. However, since they assumed high scores on their skill item reflected perceptions of control (because skill is internal to the subject), their conclusion may be invalid. The present study found no significant differences among groups on the attribution for performance measures. In summary, although Benson and Kennelly (1976) suggested that their failure to find overwhelming support for the model's predictions might be due to subject group differences in anagram-solving ability and locus of control, the present study which controlled for these effects found even less support for the theory.

CONCLUSIONS

Overall, the results of the study provided little support for the learned helplessness model of depression. With regard to the hypothesis that subjects in the noncontingent groups would exhibit anagram performance deficits relative to subjects in the control and noncontingent groups, the model was supported when the pooled groups were contrasted with each other on two of three measures. There was only minimal support for the model, however, when comparisons were made between the control and contingent, and the noncontingent groups. The hypothesis that subjects in the noncontingent groups which received aversive feedback would show more mood depression than subjects in the control, contingent, and positive noncontingent groups again was substantiated for the pooled-groups contrast, but not for individual comparisons.

Although the study was a replication and extension of Benson & Kennelly's (1976) study, results failed to support Benson and Kennelly's conclusion that noncontingent aversive outcomes, but not noncontingent positive outcomes, were responsible for the cognitive and motivational deficits associated with helplessness training. However, the fact that the present study controlled for subject differences in anagram-solving ability, locus of control, and mood depression may account for the differential findings of the two studies. Given the strong relationships observed between the covariate and dependent measures, it is suggested that future helplessness research control for such possible confounding factors.

Posttreatment questionnaire results suggested that differential perceptions of noncontrol for contingent and noncontingent groups may not have been generated by the training procedure. This may explain the study's failure to provide strong support for the learned helplessness model, since the theory purports that it is the perception of noncontrol, rather than noncontrol per se, that produces the deficits associated with helplessness training. Results indicate the importance of including manipulation checks in helplessness induction studies.

Other possible explanations for results, including lack of task importance, and immunization effects of the anagrams pretest given to control for subject differences in anagram-solving ability, were discussed, but were concluded not to play significant roles. Furthermore, subjects' attributions for their training task performance failed to adequately explain the results obtained in the study. Finally, the finding that subjects exposed to noncontingent positive feedback tended to exhibit less mood depression than all other groups suggests that this treatment may have therapeutic benefits. It is suggested that future research explore this possibility.

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APPENDIX A: DACL FORMS A AND B

(From Lubin, 1967a)

Copies of the DACL Form A and DACL Form B may be obtained from Educational & Industrial Testing Service, San Diego, California.

APPENDIX B: ANAGRAMS PRETEST

ANAGRAM SOLVING

DIRECTIONS: You will now be asked to solve some anagrams. Anagrams are words with the letters scrambled. The problem for you is to unscramble the letters so they form a word. When you have found the word, write it in the space provided. When the Experimenter tells you to begin, solve the ten anagrams below as quickly as you can.

1. milbc _____
2. lrufo _____
3. rhtib _____
4. rtypa _____
5. ohtmn _____
6. eocvi _____
7. patoi _____
8. ihrca _____
9. odelm _____
10. kcler _____

APPENDIX C: I-E SCALE

INSTRUCTIONS

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you are concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief: obviously there are no right or wrong answers.

Answer the items carefully, but do not spend more than a few seconds for each choice. Be sure to provide an answer for each choice by circling alternative a or b. In some instances you may discover that you believe both statements or neither statement. For such cases, select the one you more strongly believe to be the case as far as you are concerned. Also try to respond to each item independently: try not to be influenced by your previous choices.

1. a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy with them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck.
b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world.
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5. a. The idea that teachers are unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.
7. a. No matter how hard you try some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.
8. a. Heredity plays the major role in determining one's personality.
b. It is one's experiences in life which determine what they're like.
9. a. I have often found that what is going to happen will happen.
b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to course work that studying is really useless.

11. a. Becoming a success is a matter of hard work. Luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.
12. a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much the little guy can do about it.
13. a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14. a. There are certain people who are just no good.
b. There is some good in everybody.
15. a. In my case getting what I want has little or nothing to do with luck.
b. Many times we might just as well decide what to do by flipping a coin.
16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.
17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
b. By taking an active part in political and social affairs the people can control world events.
18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
b. There really is no such thing as "luck".
19. a. One should always be willing to admit mistakes.
b. It is usually best to cover up one's mistakes.
20. a. It is hard to know whether or not a person really likes you.
b. How many friends you have depends upon how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.
b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
22. a. With enough effort we can wipe out political corruption.
b. It is difficult for people to have much control over the things politicians do in office.
23. a. Sometimes I cannot understand how teachers arrive at the grades they give.
b. There is a direct connection between how hard I study and the grades I get.
24. a. A good leader expects people to decide for themselves what they should do.
b. A good leader makes it clear to everybody what their jobs are.
25. a. Many times I feel that I have little influence over the things that happen to me.
b. It is impossible for me to believe that chance or luck plays an important role in my life.
26. a. People are lonely because they do not try to be friendly.
b. There is not much use in trying too hard to please people, if they like you, they like you.
27. a. There is too much emphasis on athletics in high school.
b. Team sports are an excellent way to build character.
28. a. What happens to me is my own doing.
b. Sometimes I feel that I do not have enough control over the direction my life is taking.
29. a. Most of the time I cannot understand why politicians behave the way they do.
b. In the long run the people are responsible for bad government on a national as well as on a local level.

APPENDIX D: POSTTREATMENT QUESTIONNAIRE

POSTTREATMENT QUESTIONNAIRE

DIRECTIONS: Below are some statements regarding the discrimination problems phase of the experiment, with which you may agree or disagree. Please give your opinion about these items, i.e., whether you agree or disagree with the items, by circling the number most congruent with your feelings. Use the 7-point rating scales provided, where:

- 7 = strongly agree
 6 = agree
 5 = slightly agree
 4 = neither agree nor disagree; uncertain
 3 = slightly disagree
 2 = disagree
 1 = strongly disagree

1. My performance on the discrimination problems was primarily due to the difficulty of the problems.

1 2 3 4 5 6 7

2. My performance on the discrimination problems was primarily due to luck or chance.

1 2 3 4 5 6 7

3. My performance on the discrimination problems was primarily due to the control and manipulation of the experimenter.

1 2 3 4 5 6 7

4. My performance on the discrimination problems was primarily due to the amount of effort I expended on the task.

1 2 3 4 5 6 7

5. My performance on the discrimination problems was primarily due to my skill or lack of it.

1 2 3 4 5 6 7

6. My performance on the discrimination problems was primarily due to the ease of the problems.

1 2 3 4 5 6 7

POST TREATMENT QUESTIONNAIRE continued

7. It was important or desirable to me to do well on the discrimination problems.

1 2 3 4 5 6 7

APPENDIX E: ANALYSIS OF COVARIANCE FOR TRIALS, LATENCY, FAILURES, AND MOOD DEPRESSION, WITH MAIN EFFECTS FOR GROUP, SEX, AND THEIR INTERACTION

Table E1. Analysis of covariance for the dependent variable Trials to criterion

Source	df	MS	F	p > F
Covariates	3	49.880	.992	.404
Treatment group	6	90.114	1.792	.119
Sex	1	2.351	.047	.830
Group X Sex	6	32.528	.647	.692
Error	53	50.293		

Table E2. Analysis of covariance for the dependent variable Mean latency

Source	df	MS	F	p > F
Covariates	3	986.855	2.659	.058
Treatment group	6	1177.907	3.174	.010
Sex	1	1.287	.003	.953
Group X Sex	6	309.840	.853	.549
Error	53	371.131		

Table E3. Analysis of covariance for the dependent variable Failures to solve

Source	df	MS	F	p > F
Covariates	3	15.736	1.532	.217
Treatment group	6	30.252	2.945	.015
Sex	1	.207	.003	.960
Group X Sex	6	14.671	1.428	.221
Error	53	10.273		

Table E4. Analysis of covariance for the dependent variable Mood depression

Source	df	MS	F	p > F
Covariates	3	344.432	39.199	.001
Treatment group	6	14.444	1.644	.153
Sex	1	.967	.110	.741
Group X Sex	6	20.825	2.370	.042
Error	53	8.787		